

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
24 August 2000 (24.08.2000)

PCT

(10) International Publication Number
WO 00/48808 A3

(51) International Patent Classification⁷: **B28B 7/36**

(21) International Application Number: **PCT/FI00/00122**

(22) International Filing Date: 17 February 2000 (17.02.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
990326 17 February 1999 (17.02.1999) FI

(71) Applicant and

(72) Inventor: NAAMANKA, Janne, Samuli [FI/FI]; Allan
Heikelinpolku 2, FIN-02770 Espoo (FI).

(74) Agent: LAITINEN, Pauli, S.; Patentti-Laitinen OY, P.O.
Box 29, FIN-02771 Espoo (FI).

(81) Designated States (*national*): AE, AL, AM, AT, AU, AZ,
BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE,

ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP,
KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD,
MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD,
SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ,
VN, YU, ZA, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM,
KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent
(AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent
(AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU,
MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM,
GA, GN, GW, ML, MR, NE, SN, TD, TG).

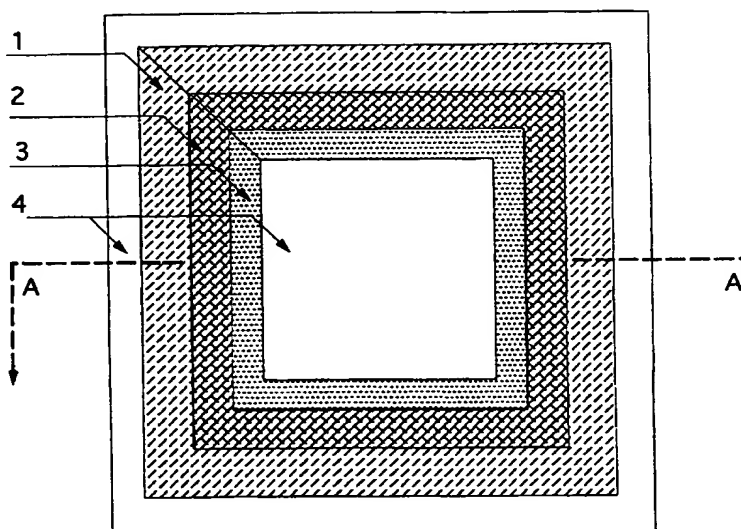
Published:

— With international search report.

(88) Date of publication of the international search report:
30 November 2000

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: A METHOD FOR CREATING A PATTERNED CONCRETE SURFACE



(57) Abstract: A method for creating a patterned concrete surface with the aid of a concrete surface retarding agent. According to the invention, a printing technique or an output technique is used to transfer the surface retarding agent forming the desired pattern to the surface coming into direct contact with the concrete to be cast. The printing or output technique can also be used to transfer a release agent or other substance affecting the surface of the concrete to the surface coming into contact with the concrete to be cast, in the same or in a separate transfer stage.

WO 00/48808 A3

INTERNATIONAL SEARCH REPORT

International Application No
PCT/FI 00/00122

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 B28B7/36

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 B28B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 20 20 339 A (BASAMENTWERKE BÖCKE KG) 18 November 1971 (1971-11-18) page 3, paragraph 2 -page 4, paragraph 1 ---	1-4,6,7
X	GB 2 246 315 A (RAPID METAL DEVELOPMENTS LTD) 29 January 1992 (1992-01-29) the whole document ---	1,2,4-6
X	US 4 050 943 A (SONDHE RATANJIT S) 27 September 1977 (1977-09-27) abstract ---	1,2,4-7
X	GB 312 216 A (GEORGE BELOE ELIIS) 22 May 1929 (1929-05-22) the whole document ---	1,2,5,6
	-/-	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
- *Z* document member of the same patent family

Date of the actual completion of the international search

8 June 2000

Date of mailing of the international search report

16.08.00

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

ANNA SANDBERG

INTERNATIONAL SEARCH REPORT

International Application No

PCT/FI 00/00122

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 055 322 A (CASSIDY HUGH I) 25 October 1977 (1977-10-25) column 2, line 59 -column 3, line 2 ---	3,7
A	US 5 236 975 A (SEKINE SUKEYOSHI) 17 August 1993 (1993-08-17) column 3, line 45 -column 4, line 48 -----	1-7

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/FT 00/00122

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
DE 2020339	A	18-11-1971	NONE	
GB 2246315	A	29-01-1992	NONE	
US 4050943	A	27-09-1977	NONE	
GB 312216	A		NONE	
US 4055322	A	25-10-1977	NONE	
US 5236975	A	17-08-1993	CA 2017938 A	01-12-1990
			CN 1052627 A,B	03-07-1991
			EP 0401051 A	05-12-1990
			CN 1048001 A,B	26-12-1990
			CN 1097371 A	18-01-1995
			JP 2601368 B	16-04-1997
			JP 3272803 A	04-12-1991
			CN 1048223 A	02-01-1991
			CN 1048002 A	26-12-1990
			JP 2617141 B	04-06-1997
			JP 3175003 A	30-07-1991
			JP 2084497 C	23-08-1996
			JP 3224953 A	03-10-1991
			JP 7103667 B	08-11-1995

PCTWORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁷ : B28B 7/36	A2	(11) International Publication Number: WO 00/48808 (43) International Publication Date: 24 August 2000 (24.08.00)
(21) International Application Number: PCT/FI00/00122 (22) International Filing Date: 17 February 2000 (17.02.00) (30) Priority Data: 990326 17 February 1999 (17.02.99) FI (71)(72) Applicant and Inventor: NAAMANKA, Janne, Samuli [FI/FI]; Allan Heikelinpolku 2, FIN-02770 Espoo (FI). (74) Agent: LAITINEN, Pauli, S.; Patentti-Laitinen OY, P.O. Box 29, FIN-02771 Espoo (FI).		(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published <i>Without international search report and to be republished upon receipt of that report.</i>
(54) Title: A METHOD FOR CREATING A PATTERNED CONCRETE SURFACE (57) Abstract A method for creating a patterned concrete surface with the aid of a concrete surface retarding agent. According to the invention, a printing technique or an output technique is used to transfer the surface retarding agent forming the desired pattern to the surface coming into direct contact with the concrete to be cast. The printing or output technique can also be used to transfer a release agent or other substance affecting the surface of the concrete to the surface coming into contact with the concrete to be cast, in the same or in a separate transfer stage.		

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece	ML	Mali	TR	Turkey
BG	Bulgaria	HU	Hungary	MN	Mongolia	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MR	Mauritania	UA	Ukraine
BR	Brazil	IL	Israel	MW	Malawi	UG	Uganda
BY	Belarus	IS	Iceland	MX	Mexico	US	United States of America
CA	Canada	IT	Italy	NE	Niger	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NL	Netherlands	VN	Viet Nam
CG	Congo	KE	Kenya	NO	Norway	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NZ	New Zealand	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	PL	Poland		
CM	Cameroon	KR	Republic of Korea	PT	Portugal		
CN	China	KZ	Kazakhstan	RO	Romania		
CU	Cuba	LC	Saint Lucia	RU	Russian Federation		
CZ	Czech Republic	LI	Liechtenstein	SD	Sudan		
DE	Germany	LK	Sri Lanka	SE	Sweden		
DK	Denmark	LR	Liberia	SG	Singapore		
EE	Estonia						

A Method for Creating a Patterned Concrete Surface

The present invention relates to a method for creating a patterned concrete surface. The method provides innumerable possibilities for shaping the surface structure of concrete in formwork and casting techniques. The method of the invention can be applied both when casting prefabricated units and in in-situ casting.

Previous use has been made of the surface retarding of concrete in concrete formwork and casting techniques, to create an exposed-aggregate concrete surface. Concrete surface retarding agents are existing substances, which retard the hardening of the concrete. They are used to create an exposed-aggregate concrete surface.

When casting prefabricated concrete units among other things, paper on which a surface retarding agent has been spread evenly is used on the bottom of the formwork, to create compact exposed-aggregate concrete units.

A surface retarding agent is also apparently used in certain applications, in such a way that the surface retarding agent is spread mechanically by hand through some kind of stencil onto the bottom of the formwork, thus creating some individual image.

Methods also exist, by means of which patterned exposed-aggregate concrete can be manufactured within predetermined limits, by using the surface retarding agent technique. Two such methods, which have something in common with the present invention, are disclosed in detail in the following. However, the publications referred to are clearly technically and economically inferior to the present invention.

The idea of one method is disclosed in patent US-4055322. In this method, the surface retarding agent is spread on a water permeable membrane. The membrane is placed in the formwork, in such a way that the surface retarding agent is directly against the formwork surface, and the concrete is cast on top of the membrane. In order to function, the surface retarding agent must travel through the membrane to

the surface of the concrete by means of diffusion, aided by water that has bled from the concrete.

5 The weakness of this method is that the need for water permeability limits the materials that can be used, on which the surface retarding agent is spread. In addition, the requirements of the fresh concrete also include a sufficient bleeding of water, which is difficult to control. This is particularly the case in present concrete technology, in which precisely the concrete grades that ensure a long-term durability feature a very small degree of water bleeding. On the other hand, a permeable
10 membrane also weakens the final result, as the movement of the retarding agent inside the membrane also in the direction of the formwork is not taken into account in the patent and probably cannot be prevented. Thus, there is no precise boundary between the exposed and unexposed surfaces. Overall, it appears that the control of the behaviour of the surface retarding agent in the method according to the patent
15 referred to is decisively poorer than in the method according to the patent now being applied for.

In practice, the formwork material immediately against the concrete on all smooth-cast concrete surfaces, made by the method according to patent US-4055322, has
20 been the water permeable membrane referred to above. The membrane may have an undesirable, and at least uncontrollable, effect on the quality of the smooth-cast surface.

25 The idea of the other method is disclosed in patent EP-0052237. In this method, a normal surface retarding agent membrane is used, with a surface treatment used to cover the part of the membrane on which an exposed-aggregate surface is not desired.

30 This method is uneconomical, in that a surface retarding agent membrane is required for the entire area to be patterned. In fact, the smooth-cast surface has not only the membrane, but also two layers of chemicals, i.e. the surface retarding agent and a varnish. In addition, the method referred to differs decisively from the present

invention, in as much as only one surface retarding agent can be used at a time.

The present invention utilizes a surface retarding agent in an attempt to create a new concept, in which the surface retarding agent is applied either with a printing
5 technique or an output technique.

The method now disclosed also provides, unlike its predecessors, an excellent opportunity of influencing the properties of the smooth-cast surface now created. As is generally known, the release agent spread on the surface of the formwork has its
10 own effect on the quality of the smooth-cast surface created. Several different release agents have been developed to suit different formwork materials and grades of concrete. Release agents can be roughly divided into the following groups, for example:

- pure mineral oils
- 15 - chemically modified vegetable oils
- mixtures of vegetable and mineral oils
- emulsified mineral oils
- emulsified vegetable oils.

20 In the method now disclosed, a suitable release agent can be spread on parts of the membrane, on which the surface retarding agent is not spread. This creates the desired quality of smooth-cast surface.

Another advantages of this embodiment is that, in prefabricated units, in which there
25 will be no patterning at all, it is sufficient to spread the same release agent as that used on the membrane onto the surface of the smooth formwork. The methods previously referred to have not had this advantage, instead, in both methods, if it is desired that the surface of an entirely smooth-cast unit is identical with the smooth-cast surface of a partly exposed-aggregate unit, membranes must also be spread on
30 these units. Here too the concrete manufacturer cannot influence the quality of the smooth-cast surface.

The method according to the invention is intended to achieve a solution with the following properties:

1. the method can be used to create a new kind of surface treatment for concrete in concrete casting technology, which allows the joints between units and the various graphic relief surfaces to be taken into account as part of the design
2. the method provides innumerable possibilities for the designer to shape the surface texture of the concrete with various graphic patterns
3. the method is as flexible as possible, and can be applied to different kinds of concrete casting
4. the point of departure of the method is the most designer-friendly production possible. The designer may send the finished design over a data network to the factory where it will be produced
5. a central objective, concerning the runoff of rainwater and the dirtiness of city air, is to anticipate the dirtying of the facade already during design
6. significant additional costs are avoided, compared to a conventional concrete surface.

The method is based on using concrete surface retarding agents, and, if desired release agents or other desired substances, either by printing techniques or output techniques, in formwork and casting technology. The desired surface pattern is transferred to the casting surface of the formwork, either by printing techniques or output techniques, in which a concrete surface retarding agent is used as the pigment. Modern printing and output techniques make it possible, if desired, the simultaneous or sequential addition of several different surface retarding agents or other substances, which have different effects on the concrete surface. This is because the basic principle of the invention includes not only the formation of a certain pattern, but also the surfacing of areas, to which a surface retarding agent is not added, with a release agent or other substance affecting the concrete surface and, in turn, the quality of the concrete piece created. The surface retarding agents may be of types that affect at different depths.

The casting surface of the formwork may be especially a membrane-like material, for example, coated paper or some other material, to which the pattern is transferred either by a printing or an output technique, in which a surface retarding agent acts as the printing agent or output agent. The technique may be serigraphy, flexography, a digital output technique, or any other printing or output technique. Once the cast concrete has hardened, the formwork is released and the concrete piece washed, to form a pattern on the parts of the exposed-aggregate surface, in which the surface retarding agent was in the formwork.

The method has several advantages over previously known methods of patterning concrete surfaces. Known methods of creating patterns in prefabricated concrete units have included various profiles attached to the bottom of the formwork, surface retarded spread with a brush through some stencil on the bottom of the formwork, sand-blasted patterns on the surface of the concrete unit, or the mechanical grooving of the concrete units. These previously known methods are largely manual processes and thus time-consuming and prevent less restricted patterns being created on the concrete surface. Compared to the state of the art of the publications referred to above, the method of the present invention is more diverse, and economically and ecologically more rational.

The new method according to the invention permits more highly automated production and innumerable possibilities for varying the patterns. It can be used to create a three-dimensional effect on the surface of a concrete piece being manufactured, as the invention makes it easy to create various of depth effects, as disclosed later with reference to the drawings and examples of embodiments.

The invention is disclosed in detail with reference to the accompanying drawings, in which:

Figure 1 shows one solution created according to the invention seen from directly above;

Figure 2 shows a cross section of the shape of a concrete piece obtained by using the method according to the method; and

Figure 3 shows a cross section A-A in Figure 1.

In Figures 1, 2, and 3, the layers are drawn with a considerable thickness for reasons of clarity, without intending to show the actual thickness of the layers. In practice, the layers are very thin. The aggregate particles exposed on the surface of the concrete, which are central to the final result, have intentionally not been shown in Figure 2.

In the examples shown in the Figures, three surface retarding agents that retard to different wash depths are used, and are spread on the surface by means of a printing or output technique. The reference numbers 1, 2, and 3 mark these layers. The retarding agent marked by the number 1 retards the hardening of the concrete to the greatest depth, as shown in the profile in Figure 2. The agent marked with the number 2 has a moderate effect while that with reference number 3 has the least retarding effect.

As Figure 1 shows, the patterns from the surface retarding agents are clear and in sharp outline. Thus, they also create a direct and sharply drawn image. In the Figures, reference number 4 marks the release agent, which is added to the surface using the same technique as the surface retarding agent. Generally, the same work stage or sequential work stages can be used to add the various materials. In the same way, when spreading different substances, an output technique can be used if desired with one substance and a printing technique with another. A technique may be selected because, for example, one substance is more easily spread with one technique and the other with another.

The essentially water impermeable membrane, to which substances 1, 2, 3, and 4 are transferred by a printing or output technique, is marked by number 5. Number 6 shows the formwork platen, on which the patterned surface retarding agent membrane is placed. In Figure 2, reference number 7 refers to the concrete.

In the following, the method is disclosed with the aid of examples of embodiments:

Embodiment example 1

5 Serigraphy on a membrane

The desired surface pattern is transferred to the membrane using serigraphy, in which a concrete surface retarding agent is used as the printing ink. This creates a
10 patterned surface retarding agent membrane, with the concrete surface retarding agent forming the desired patterns on the membrane. Serigraphy is an existing semiautomatic technique. In serigraphy, the desired number of surface retarding agents, release agents, or other substances can be printed. At the concrete factory, the patterned surface retarding agent membrane is spread on the bottom of the
15 formwork and the concrete material is poured into the formwork. Once the concrete has hardened, the concrete unit is released from the formwork and its surface is washed. The pattern arises in these parts of the surface of the concrete, in which there has been surface retarding agent in the membrane.

Selecting the correct type of membrane prevents crumpling of the surface retarding
20 agent membrane during the process and if desired, by perforating the base of the unit-casting formwork and connecting the holes thus formed to a vacuum reservoir. The vacuum holds the surface retarding agent membrane tightly onto the bottom of the formwork. In in-situ casting, the patterned surface retarding agent membrane can be used according to the invention in such a way that an adhesive secures the
25 membrane to the casting surface of the formwork.

Embodiment example 2

30 Flexography on a membrane

The desired surface pattern is printed on the membrane with a flexograph printing press, using concrete surface retarding agent as the printing ink. A flexograph printing

press is a so-called roller printing press, in which the prepared printing plates are attached around the roller. A flexograph printing press can print, depending on the machine, a 3 – 5-metre impression and a repeating pattern up to three metres long. A flexograph printing press can print in four colours in one and the same work stage.

5 The flexograph technique is generally regarded as more economical than serigraphy in larger print runs. In concrete casting, a surface retarding agent membrane printed by this technique is used in the same way as in embodiment example 1.

Embodiment example 3

10

Digital output technique

15

The desired surface pattern is programmed on a digital printer, which can print an impression up to 5 metres wide. The length of the output impression is not restricted, but can be as long as the file, so that, for example, a varying pattern 5 kilometres long can be output. Such a digital output printer can print on any material at all, because the printing nozzles are well clear of the printing material. Such a printer is apparently used at least in the automobile industry, to meet orders for individually painted cars.

20

Concrete surface retarding agents and release agents are used as printing inks when manufacturing a patterned surface retarding agent membrane in a digital printer.

25

These substances are formed to the same viscosity as the colours normally used in the machine. The layer thickness of the substances to be printed can be adjusted digitally, without restriction. Such a digital printer prints the desired pattern digitally on the desired material. The printing material may be, for example, a membrane impermeable to water, formwork plywood, or the bottom of the concrete unit formwork, which is generally stainless steel.

30

A surface retarding agent membrane output by this technique is used to cast a prefabricated concrete unit in the same way as in embodiment example 1. Formwork plywood, which has been printed with concrete surface retarding agent patterns using this technique, can be used in in-situ casting. The bottom of formwork, which has

been printed with concrete surface retarding agent patterns using this technique, is used in prefabricated concrete unit casting technology.

Claims

1. A method for creating a patterned concrete surface with the aid of a concrete surface retarding agent, **characterized** in that the surface retarding agent material forming the desired pattern is transferred directly to the surface coming into direct contact with the concrete to be cast, by means of a printing technique or an output technique.

2. A method according to Claim 1, **characterized** in that the release agent or other substance affecting the surface of concrete is also transferred to the surface coming into contact with the concrete to be cast, in the same or in a separate transfer stage.

3. A method according to Claim 2, **characterized** in that serigraphy, flexography, offset printing, or a digital output technique is used to transfer the surface retarding agent and other possible substances to the aforementioned surface.

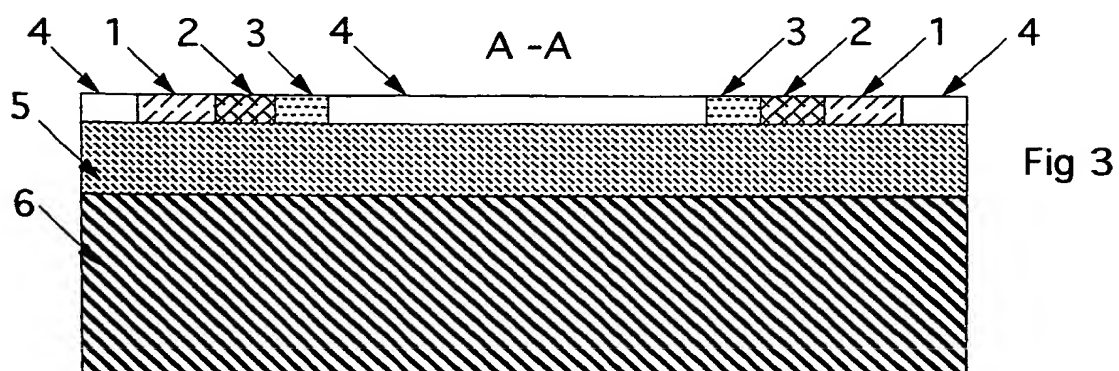
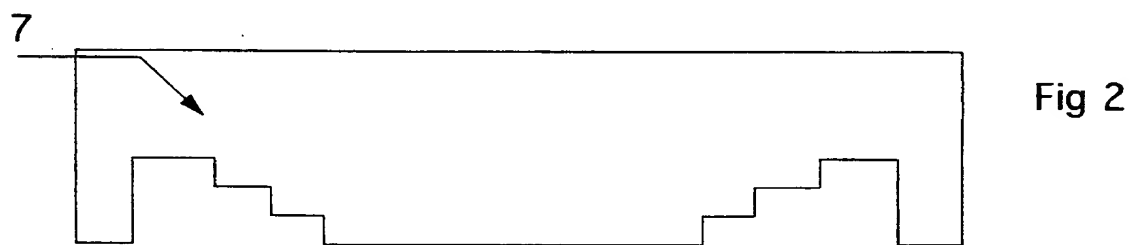
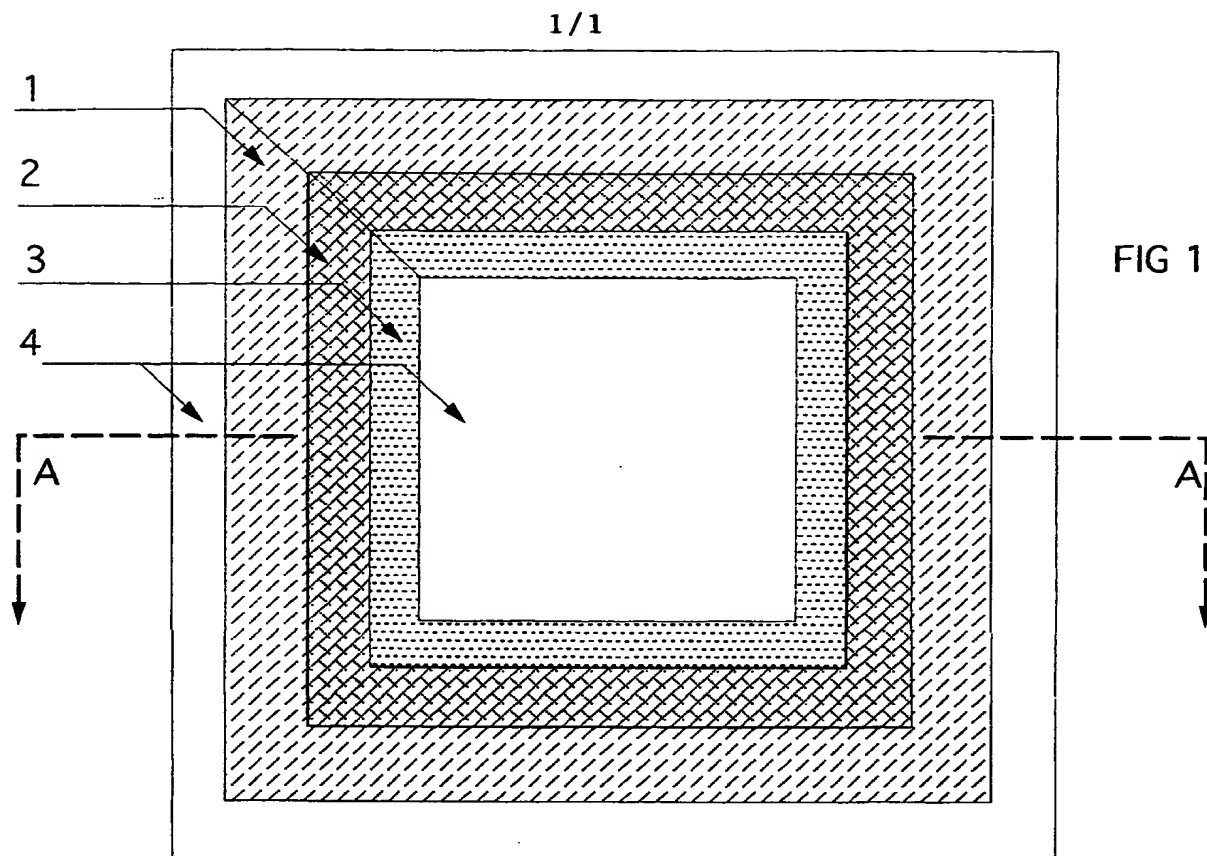
4. A method according to one of the above Claims, **characterized** in that the desired pattern to be created with the concrete surface retarding agent is formed on a membrane made from a cellulose, plastic, or metal based material, which is then placed on the bottom of the formwork, with the pattern facing the concrete material to be cast.

5. A method according to one of the above Claims, **characterized** in that the desired pattern to be created with the concrete surface retarding agent is formed directly on the bottom of the formwork.

6. A method according to one of the above Claims, **characterized** in that, after casting, the cast concrete piece is washed conventionally to wash off the concrete, the hardening of which has been retarded to create a pattern.

7. A method according to one of the above Claims, **characterized** in that surface retarding agents acting at different depths to form a certain pattern, and at least one

other agent affecting the surface of the concrete, such as a release agent, are transferred to the surface coming into contact with the concrete piece to be cast.



PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No.	International filing date (day/month/year)	(Earliest) Priority Date (day/month/year)
PCT/ FI 00/ 00122	17/02/2000	17/02/1999
Applicant		
NAAMANKA, Janne, Samuli		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.



It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.



the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :



contained in the international application in written form.



filed together with the international application in computer readable form.



furnished subsequently to this Authority in written form.



furnished subsequently to this Authority in computer readable form.



the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.



the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the title,



the text is approved as submitted by the applicant.



the text has been established by this Authority to read as follows:

5. With regard to the abstract,



the text is approved as submitted by the applicant.



the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No.



as suggested by the applicant.



because the applicant failed to suggest a figure.



because this figure better characterizes the invention.

1



None of the figures.

P NT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT OR THE DECLARATION

(PCT Rule 44.1)

To:

PATENTTI-LAITINEN OY
Attn. LAITINEN, PAULI S.
P.O. Box 29
FIN - 02771 ESP00
FINLAND

Date of mailing
(day/month/year)

16/08/2000

Applicant's or agent's file reference

FOR FURTHER ACTION See paragraphs 1 and 4 below

International application No.

PCT/ FI 00/ 00122

International filing date
(day/month/year)

17/02/2000

Applicant

NAAMANKA, Janne, Samuli

1. ☒ The applicant is hereby notified that the International Search Report has been established and is transmitted herewith.

Filing of amendments and statement under Article 19:

The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46):

When? The time limit for filing such amendments is normally 2 months from the date of transmittal of the International Search Report; however, for more details, see the notes on the accompanying sheet.

Where? Directly to the International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland
Facsimile No.: (41-22) 740.14.35

For more detailed instructions, see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no International Search Report will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.

3. ☐ **With regard to the protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Further action(s):** The applicant is reminded of the following:

Shortly after **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.

Within **19 months** from the priority date, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later).

Within **20 months** from the priority date, the applicant must perform the prescribed acts for entry into the national phase before all designated Offices which have not been elected in the demand or in a later election within 19 months from the priority date or could not be elected because they are not bound by Chapter II.

Name and mailing address of the International Searching Authority



European Patent Office, P.B. 5818 Patentlaan 2
NL-2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Amélie Möller

INTERNATIONAL SEARCH REPORT

International Application No

PCT 00/00122

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 B28B7/36

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 B28B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 20 20 339 A (BASAMENTWERKE BÖCKE KG) 18 November 1971 (1971-11-18) page 3, paragraph 2 -page 4, paragraph 1 ---	1-4,6,7
X	GB 2 246 315 A (RAPID METAL DEVELOPMENTS LTD) 29 January 1992 (1992-01-29) the whole document ---	1,2,4-6
X	US 4 050 943 A (SONDHE RATANJIT S) 27 September 1977 (1977-09-27) abstract ---	1,2,4-7
X	GB 312 216 A (GEORGE BELOE ELIIS) 22 May 1929 (1929-05-22) the whole document ---	1,2,5,6
	--- -/--	

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

8 June 2000

Date of mailing of the international search report

16.08.00

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

ANNA SANDBERG

INTERNATIONAL SEARCH REPORT

International Application No

PCT 00/00122

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 055 322 A (CASSIDY HUGH I) 25 October 1977 (1977-10-25) column 2, line 59 -column 3, line 2 ---	3,7
A	US 5 236 975 A (SEKINE SUKEYOSHI) 17 August 1993 (1993-08-17) column 3, line 45 -column 4, line 48 -----	1-7

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT 00/00122

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
DE 2020339	A	18-11-1971	NONE		
GB 2246315	A	29-01-1992	NONE		
US 4050943	A	27-09-1977	NONE		
GB 312216	A		NONE		
US 4055322	A	25-10-1977	NONE		
US 5236975	A	17-08-1993	CA	2017938 A	01-12-1990
			CN	1052627 A,B	03-07-1991
			EP	0401051 A	05-12-1990
			CN	1048001 A,B	26-12-1990
			CN	1097371 A	18-01-1995
			JP	2601368 B	16-04-1997
			JP	3272803 A	04-12-1991
			CN	1048223 A	02-01-1991
			CN	1048002 A	26-12-1990
			JP	2617141 B	04-06-1997
			JP	3175003 A	30-07-1991
			JP	2084497 C	23-08-1996
			JP	3224953 A	03-10-1991
			JP	7103667 B	08-11-1995

PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

To:

Assistant Commissioner for Patents
United States Patent and Trademark
Office
Box PCT
Washington, D.C.20231
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 13 October 2000 (13.10.00)	
International application No. PCT/FI00/00122	Applicant's or agent's file reference
International filing date (day/month/year) 17 February 2000 (17.02.00)	Priority date (day/month/year) 17 February 1999 (17.02.99)
Applicant NAAMANKA, Janne, Samuli	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:
07 September 2000 (07.09.00)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was

☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer S. De Michiel Telephone No.: (41-22) 338.83.38
---	---

PATENT COOPERATION TREATY

PCT

REC'D 08 MAY 2001

WIPO

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference ---	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/FI00/00122	International filing date (day/month/year) 17/02/2000	Priority date (day/month/year) 17/02/1999
International Patent Classification (IPC) or national classification and IPC B28B7/36		
Applicant NAAMANKA, Janne Samuli		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.


2. This REPORT consists of a total of 4 sheets, including this cover sheet.

- ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 1 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 07/09/2000	Date of completion of this report 04.05.2001
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Schoufour, F Telephone No. +49 89 2399 8919



INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/FI00/00122

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17):*):

Description, pages:

1-9 as originally filed

Claims, No.:

1-6 as received on 04/04/2001 with letter of 30/03/2001

Drawings, sheets:

1/1 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/FI00/00122

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims 1-6
	No: Claims
Inventive step (IS)	Yes: Claims 1-6
	No: Claims
Industrial applicability (IA)	Yes: Claims 1-6
	No: Claims

2. Citations and explanations
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

CONCERNING ITEM V

1. The invention is dealing with a method for creating a patterned concrete surface with the aid of a concrete surface retarding agent, which is transferred directly to the surface coming into direct contact with the concrete to be cast, by means of a printing technique or an output technique.
Such a method is f.i. known from document DE-A-20 20 339.
2. The invention provides that a release agent is also transferred to the surface coming into contact with the concrete to be cast, in the same or in a separate transfer stage.
3. This method provides many possibilities for the designer to use various patterns on a concrete surface ; such patterns can be transferred to the concrete by automated processes and need no more manual processes.
4. Thus, the subject matter of claim 1 is new over the prior art ; it is also considered to be inventive since there is no indication in the prior art for such specific method for creating a patterned concrete surface as defined in claim 1. Therefore, claim 1 meets the requirements of Articles 33(2) and 33(3) PCT.
5. The dependent claims 2 to 6 define further details of the invention and as such they also meet the requirements of Articles 33(2) and 33(3) PCT.

CONCERNING ITEM VIII

6. The expression "or other substance affecting the surface of concrete" in claim 1 is unclear. Claim 6 contains a similar expression. There is no indication in the application what kind of substance this could be. This expression should therefore be deleted out of the application.
7. Document DE-A-20 20 339, constituting the closest prior art, has not been discussed in the description.

* * *

Claims

1. A method for creating a patterned concrete surface with the aid of a concrete surface retarding agent, which is transferred directly to the surface coming into direct contact with the concrete to be cast, by means of a printing technique or an output technique, **characterized** in that also release agent or other substance affecting the surface of concrete is transferred to the surface coming into contact with the concrete to be cast, in the same or in a separate transfer stage.
2. A method according to claim 1, **characterized** in that serigraphy, flexography, offset printing, or a digital output technique is used to transfer the surface retarding agent and other possible substances to the aforementioned surface.
3. A method according to claim 1 or 2, **characterized** in that the desired pattern to be created with the concrete surface retarding agent is formed on a membrane made from a cellulose, plastic, or metal based material, which is then placed on the bottom of the formwork, with the pattern facing the concrete material to be cast.
4. A method according to one of the above claims, **characterized** in that the desired pattern to be created with the concrete surface retarding agent is formed directly on the bottom of the formwork.
5. A method according to one of the above claims, **characterized** in that, after casting, the cast concrete piece is washed conventionally to wash off the concrete, the hardening of which has been retarded to create a pattern.
6. A method according to one of the above claims, **characterized** in that surface retarding agents acting at different depths to form a certain pattern, and at least one other agent affecting the surface of the concrete, such as a release agent, are transferred to the surface coming into contact with the concrete piece to be cast.

other agent affecting the surface of the concrete, such as a release agent, are transferred to the surface coming into contact with the concrete piece to be cast.